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### **REMARKS/ARGUMENTS**

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful.

#### **Objections to the Specification**

The specification has been objected to because the word "an" on page 1 line 7 is a typographical error and should be replaced by the word "a". Applicant thanks the Examiner for the careful reading of the specification and has corrected the error (see attached amendments to the specification on page 2). Applicant therefore respectfully requests that the objection be withdrawn.

#### **Status of Claims and Support for Changes in the Claim Listing**

Claims 1-27 were originally pending in the application.

Claims 1-27 were rejected.

Claims 16, 18, 20, 24, and 26 are cancelled.

Claims 1, 9-14, 17, 19, 21, 25, and 27 are currently amended.

Claims 28-32 are new.

Any amendments and cancellations detailed here should not be construed to have been made in order to overcome prior art unless specified otherwise.

Claims have been amended or added in order to clarify the subject matter of the application. In making these revisions and additions, care has been taken to ensure that no new matter has been added.. The lines from the original specification are stated and/or reproduced below solely to demonstrate that no

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new matter has been added, and therefore no limitations should be read into the claims based on these stated and/or reproduced specification lines.

The claim amendments and new claims are supported by the originally filed specification, as follows:

In claims 1, 12, 13, 21, 25, and 27 it has been clarified that the worklist is a digital image communication in medicine (DICOM) modality worklist and that the worklist is generated by a hospital information system (HIS) or radiology information system (RIS). Support for these amendments is found inter-alia on page 15, line 31 to page 16 line 2 and on page 15 lines 2-4:

Refer to Fig. 7 which shows an example of a DICOM modality worklist 700, according to a preferred embodiment of the present invention. Worklist 700 can be considered a special format of generic worklist 200, adapted to conform to the DICOM standard.

A radiology information system RIS 410 or alternatively a hospital information system HIS 410 functions as the information system for radiology or hospital patients and as the worklist generator.

In claim 12 and 27, it has been further clarified that it is the hospital information system (HIS) or radiology information system (RIS) that is queried and that the DICOM modality worklist may schedule tasks for any type of modality (and not necessarily only for image acquisition machines). Support for these amendments is found inter-alia on page 15 lines 22-24 and on page 15 lines 7-8:

The worklist management service allows elements of system 400 to query the modality worklist generator RIS or HIS 410 and receive the assigned tasks for each modality 420.

In the dicom system, the modalities can be things other than image acquisition machines, such as ECG.

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Claim 14 has been amended to specify that the hospital information system (HIS) or radiology information system is configured to generate the worklist. Support for this amendment is found inter-alia on page 15 lines 2-4 reproduced above.

Claim 17 has been amended to clarify that the DICOM standard is used for communication between the hospital information system (HIS) or radiology information system and the prefetcher. Support for this amendment is found inter-alia on page 15 lines 15-16:

Communication between the different components of system 400 follows the DICOM standard 450.

Claim 19 has been transformed from an independent claim into a dependent claim on claim 13 where at least one modality is an image acquisition machine. This transformation into a dependent claim has been made because it was deemed that the dependent form was sufficient and in order to reduce the number of independent claims. Support for this amendment is found inter-alia in the original claim 19 and on page 15 line 5-8:

In system 400, the modalities are image acquisition machines 420, for example x-ray machines, magnetic resonance imaging (MRIs), computed tomography (CTs), ECG etc. In the dicom system, the modalities can be things other than image acquisition machines, such as ECG.

In claims 9 and 10 the to faulty antecedent basis has been corrected.

Claim 11 has been amended to delete the limitation of the worklist being a DICOM modality worklist since claim 1 on which claim 11 depends now specifies the worklist as a DICOM modality worklist.

Independent claim 28 has been added reciting a method of querying a hospital information system (HIS) or radiology information system (RIS) relating to at least one task for at least one modality scheduled by a DICOM worklist

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generated by the HIS or RIS and getting ready for the task. Independent claims 31 and 32 describe a system and computer program product respectively which are counterparts to method claim 28. Support for these claims is found inter-alia on page 15 lines 22-31, on page 18 line 11-12, and in Figure 4:

The worklist management service allows elements of system 400 to query the modality worklist generator RIS or HIS 410 and receive the assigned tasks for each modality 420. The rate of querying is configurable and may be the same or different for different elements of system 400. In addition the rate of querying may be the same or may differ for a particular querying element depending on factors such as how busy the querying element is, time of day, etc. The querying entity may be, for example each modality 420, so as to prepare for the expected task. In accordance with the present invention, prefetcher 460 uses the worklist management service to periodically query the worklist for tasks assigned to all modalities 420 and thereby predict storage use.

In stage 540, prefetcher 460 queries HIS 410 and receives data on the assigned task.

Dependent claim 29 has been added reciting one embodiment where the getting ready includes ensuring that in a faster access part of a medical storage which includes a faster access part and a slower access part there is available at least some data which based on at least one predetermined rule is deemed likely to be accessed in connection to said at least one task which said DICOM modality worklist has scheduled said at least one modality to perform. Support for this new claim is found inter-alia on page 16 line 24 to page 17 line 10:

In one embodiment, prefetcher 460 uses patient name 706, patient ID 708, modality 718, scheduled station AE title tag 720, start date 722, start time 724, referring physician's name 710 and performing physician's name 730 to ensure that relevant data related to the assigned task is located in faster access storage part 432 of storage 430. For example examiner component 310 of prefetcher 460 can examine modality 718 and title tag 720 and thereby determine using predetermined rules the type(s) of data which (generic) information consumers are likely to access for the assigned task. As another

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example, examiner component 310 may designate referring physician (or other referring medical staff) 712 and/or performing physician (or other performing medical staff) 730 as information consumers 440 and tailor the types of data accordingly. As another example, cross referencer component 320 of prefetcher 460 may use patient name 706 and patient ID 708 to compare the types of data determined by examiner 310 with data actually stored for the identified patient. As another example, retriever component 330 may use start date 722 and/or start time 724 as a deadline for retrieving any relevant data only stored in slower access part 434. In other embodiments, prefetcher 460 may use additional information on worklist 700, less information on worklist 700 and/or different information on worklist 700 to ensure that relevant data related to the assigned task is located in faster access storage part 432 of storage 430.

Dependent claim 30 has been added reciting one embodiment where the querying and preparing are performed by a scheduled modality. Support for this amendment is found *inter-alia* on page 15 lines 27-28:

The querying entity may be, for example each modality 420, so as to prepare for the expected task.

Claim 16, 18, 20, 24, and 26 have been cancelled in order to present a concise new set of claims and so as to not incur additional expenses due to the new claims. No implication on the desirability, accuracy, novelty or inventive step of the cancelled claims should be construed from the cancellation.

### Claim Rejections

#### *35 U.S.C. § 112 Rejections*

In the office action, the Examiner rejected claims 9 and 10 under 35 U.S.C 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 9 and 10 lacked proper antecedent basis due to inaccurate dependencies. Applicant thanks the Examiner for pointing out the inaccuracies in

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these claims and has followed the Examiner's suggestions in amending claim 9 to depend on claim 8, and amending claim 10 to depend on claim 9 (see claim listing for amendments). Applicant respectfully asserts that claim 9 and 10 as amended are proper under 35 USC 112 and requests that the rejection be withdrawn.

### *35 U.S.C. § 102 Rejections*

The Examiner has rejected claims 1-7 and 11-27 under 35 U.S.C 102(e) as being anticipated by Cooke, Jr. et al (US 6,574,629, hereinafter "Cooke").

Applicant appreciates the time and consideration provided by the Examiner in reviewing this application, however, respectfully traverses the rejection of the claims at least for the following reasons.

Anticipation under 35 U.S.C. 102 requires that each and every claimed feature be disclosed by a single prior art reference.

Applicant respectfully states that Cooke neither teaches nor suggests a digital image communication in medicine (DICOM") modality worklist which is generated by a hospital information system ("HIS") or ("RIS") as recited in each of the independent claims 1, 12, 13, 21, 25, 27, 28, 31, and 32 currently pending in this application.

As stated in the background section of the current application, in the related art, some smart medical storage management systems utilize Health Level 7 (HL7) information to predict storage usage. However in some cases the HL7 information is unavailable, inadequate, or too general. See for example page 2 lines 1 to 16 of the current application reproduced here:

The Health Level 7 (HL7) standard addresses the interfaces among various systems that send or receive patient admissions/registration, discharge or transfer (ADT) data, queries, resource and patient scheduling, orders, results, clinical observations, billing, master file update information, medical records, scheduling, patient referral, and patient care. Some smart medical storage management systems utilize HL7 information such as patient admission and discharge information in order to predict which stored data objects may be required (i.e.

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predict storage usage). These storage management systems can then transfer those predicted data objects to a faster access storage. However HL7 information is not always available because HL7 is not supported by all hospitals, and even when available, HL7 information is not complete (for example while the HL7 order message may not provide the name of the image acquisition machine assigned to the patient nor the exact time for the procedure, it does provide the procedure's date and patient's details). In addition, because the HL7 information (such as that passed in the HL7 admission message) is of a general nature, prediction of storage usage based on HL7 may result in caching more stored data objects than necessary.

Cooke describes such a smart medical storage management system where HL7 information is transferred from the RIS. Only the transfer of HL7 information from the RIS 44 to the RIS gateway/PACS broker 46 is illustrated in each figure depicting both RIS 44 and PACS broker/RIS gateway 46. For example, see Figure 1 and Figure 4 of Cooke. See also, for example column 13, lines 4 to 12 of Cooke (reproduced below) where it is specified that PACS broker 46 communicates in HL-7 with the RIS.

Specifically, PACS broker 46 is a stand-alone platform that listens to the RIS and responds to query/retrieve statements from the PACS core components by accessing appropriate data from the RIS. To this end, PACS broker 46 is able to communicate in HL-7 ("Health Level 7) with the RIS and to communicate in DICOM with network gateway 6. Thus, the PACS broker makes patient demographics, schedules, study parameters and reports on the RIS available to the core PACS components (underline added).

It is evident from the above quote that in Cooke the communication with the RIS 44 is in HL-7. There is neither a hint nor an indication that any information other than HL-7 information is transferred from the RIS 44. Certainly there is no mention of a DICOM modality worklist being available from the RIS 44.

It is also evident from the above quote that in Cooke all requests for information from the RIS 44 go through the RIS gateway/PACS broker 46. There

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is no possibility of direct querying of the RIS 44 by the PACS. See also Cooke Column 22, lines 10 where it is stated that in order to obtain information from RIS 44 a PACS broker/RIS gateway 46 is typically required:

As described above, in order to obtain information from the HIS or RIS, a PACS broker (i.e. RIS gateway 46) is typically required on the PACS

See also Cooke Column 18 lines 59 to 65 where the querying by the network gateway is via the PACS broker/RIS gateway 46:

In more detail, pre-fetching involves RIS gateway 46 receiving information concerning a scheduled event from RIS 44, and then transmitting that information to the PACS, in particular to network gateway 6 (see FIG. 1). The network gateway then queries the RIS, via the RIS gateway, requesting details concerning the scheduled event.

This requirement in Cooke to go through the RIS gateway/PACS broker 46 (due to the necessity in Cooke of communicating with the RIS 44 in HL-7) may be viewed by some as a disadvantage of the system described in Cooke.

To further distinguish Cooke from the invention recited in the independent claims, in Cooke worklist generation is not performed by the RIS (or HIS). Instead, Cooke clearly states that worklist generation is performed by the reviewing stations. See for example, column 11 lines 41 to 54:

The reviewing stations also perform automatic worklist generation and updates as relevant studies arrive. Regarding worklist generation, upon logging in to the PACS via a reviewing station, a user may enter a query asking the PACS to locate a study or group of studies based on input criteria, such as an accession number, which is a unique identifier for each study. Once these studies have been located, the PACS generates, and the reviewing station displays, a user interface called a main study window. This main study window is comprised of action buttons, system status indicators, and a main study list which includes studies that match the input criteria. The worklist comprises

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the study, or group of studies, that the user selects from the main study list (underline added).

See also for example column 35 lines 31 to 51 of Cooke:

Worklist criteria section 353 permits the user to generate worklists using only one mouse click by clicking on a displayed action button. To this end, worklist criteria section 353 includes worklist selection rules button 360, which creates the worklist select button (see section 3.1) in the main study list. Clicking on this button causes other buttons to appear, so long as they have been set in the user profile form. These buttons include send (display) button 361 which permits a user to view partially local studies that are in the process of being retrieved to the user's station; worklist cached button 362 which permits the user to select all cached studies in the PACS cluster that meet remaining criteria; relevant priors button 363 that allows the user to select relevant prior studies; priors match modality button 364 that allows the user to "fine-tune" selection of prior studies; priors match speciality button 365 that further "fine-tunes" selection of prior studies; select worklist specialty button 366 that permits the user to select studies based on body part; select acquisition station button 367 that allows users to select studies from a particular imaging modalities, and study status button 368 for selecting a default status. (underline added)

Furthermore, there is neither a hint nor an indication that the worklist described in Cooke is similar to the worklist of the current application. For example, Cooke talks about prefetching relevant studies to a reviewing station in column 18 lines 55-59.

The present invention includes the ability to route relevant prior studies to a reviewing station in contemplation of a scheduled event, such as a patient examination or the like. This process is called prefetching, and is effected by code executing on the network gateway. (underline added)

Note that Cooke in Column 11 lines 53 to 54 specifically equates the worklist with the studies.

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The worklist comprises the study, or group of studies, that the user selects from the main study list.

Therefore in contrast to one embodiment of the current invention where the worklist is used in ensuring that data deemed likely to be accessed is available in a faster access part, in Cooke it is the relevant worklists which are prefetched. This distinction is further proof that the worklist of the invention of the current application differs from the worklist described in Cooke.

To summarize, in Cooke there is neither a hint nor an indication of DICOM modality worklist generation by the RIS or HIS, an important feature of the current invention. This feature is recited in each of the independent claims 1, 12, 13, 21, 25, 27, 28, 31, and 32 currently pending in this application, as presented in the claim listing above. Applicant therefore respectfully asserts that each of independent claims 1, 12, 13, 21, 25, 27, 28, 31, and 32 are allowable. Dependent claims 2-11, 14-15, 17, 19, 21-23, and 29-30 which depend directly or indirectly from the independent claims therefore include the limitations of the independent claims. Applicant therefore respectfully asserts that the dependent claims are also allowable.

Applicants believe the remarks presented hereinabove to be fully responsive to all of the grounds of rejection raised by the Examiner. In view of these remarks, Applicants respectfully submit that the specification and all of the claims in the present application are in order for allowance. Notice to this effect is hereby requested.

Please charge any fees associated with this paper to deposit account No. 09-0468.

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Respectfully submitted,

By: Stephen C. Kaufman  
Stephen C. Kaufman  
Reg. No. 29,551  
Phone No. (914) 945-3197

Date: May 1, 2006

IBM Corporation  
Intellectual Property Law Dept.  
P. O. Box 218  
Yorktown Heights, New York 10598

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